The Changing Face of Biological Warfare Defense

By Mr. Al Mauroni

Over the last two years, discussions on biological warfare (BW) defense inside the Beltway have taken on an increasingly strident tone. These discussions, initiated by the Office of the Secretary of Defense (OSD) for Counterproliferation (CP) Policy and echoed by the National Defense University's Center for CP Research and other critics, propose that the military services have incorrectly addressed BW defense since Operation Desert Storm. Specifically, the charge has been that the military services had adopted a "chem-centric" view of BW defense, instead of appreciating and addressing the unique aspects of the BW challenge.

As the Joint Service Installation Pilot Project (JSIPP) continues to field chemical and biological detectors at nine military installations during early 2004, the question of how to best employ biological detection assets at installations that do not have the manpower or resources to sustain 24-hour, 7-day coverage is still unclear. The Defense Planning Guidance released in April 2002 directed the Chairman of the Joint Chiefs of Staff (CJCS) to review the need to develop and promulgate a joint concept of operations plan (CONPLAN) for the BW defense of joint task forces and fixed sites. Meanwhile, the Air Force and the Navy have invested considerable resources in developing their own service concept of operations (CONOPS) for BW defense. This all leads to one major question—are we doing something wrong today? What new insights or data have emerged that led these critics to believe that our military forces have a flawed approach to conducting BW defense?

The argument that many military analysts view the execution of chemical and biological defense similarly has a ring of truth to it. Certainly, we all say the words "chemical and biological defense" often and very easily, perhaps without appreciation that they are two distinct operations. There has been an intellectual laziness in the sense that many people feel that future detectors should sense chemical and biological hazards simultaneously, as we develop protective equipment, protective shelters, and decontaminants designed to also counter chemical and biological agent effects simultaneously. Modernization plans call for integrated chemical and biological sensor platforms and the fielding of thousands of tactical-level biological detectors, without considering the fact that biological agents have different hazard footprints than chemical agents or that the cost of fielding tactical detectors may outweigh the immediate benefits. It is this evidence that causes some critics to point out that the military does not appreciate the very distinct physical properties and effects of chemical agents (quick-acting, tactical weapons) versus biological agents (slow-acting, theater-level weapons). Toxins—chemical agents produced by biological organisms (such as the botulinum toxin)—further blur the distinction between chemical and biological agents.

> *"…biological agents have different hazard footprints than chemical agents..."*

Conversely, while chemical and biological agents have different physical properties and effects, they do have similar employment properties. Chemical and biological weapons are two sides of the same coin: they both originate from the field of natural sciences and are employed on the modern battlefield, and they both harm humans and animals based on their inherent interactions with living matter, generally attacking through the skin and respiratory tract (as opposed to explosives or piercing weapons). They are delivered by similar weapon systems: artillery projectiles, aerial bombs, aerial and ground aerosol sprayers, ballistic missiles, and even hand grenades, as well as through covert operations using small amounts against individual targets. Most chemical

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and biological agents are largely invisible to the naked eye and have little or no odor; they can both cause mass casualties quickly if disseminated in large quantities over large areas. Both chemical and biological weapons provide an unconventional capability of demoralizing, diminishing, or destroying a military force that is unprepared for their effects. Because chemical and biological weapons share a common scientific kinship and both use similar weapon systems to target people, there is a common defensive approach to facing these weapons.

What Is Not New

Critics offer that the military services focus too much on the detection of biological hazards through automated sensors as a means to protect against exposure, noting that technology does not permit a "detect-to-warn" capability. A main concern was that by treating BW defense as a "subset" of nuclear, biological, and chemical (NBC) defense, the military was arbitrarily limiting its procedures and doctrine, thus limiting its overall defensive capabilities. Despite years of demonstrated experience, especially following the Gulf War, Army subject matter experts could not convince their critics that they had an effective biological defense strategy. Current biological detectors will not prevent personnel from being exposed to biological agents, but they do provide a warning that allows enough time for effective medical countermeasures. Due to this perceived shortcoming, the OSD and other critics suggested that military forces migrate from an "avoid, protect, and decontaminate" concept to a "monitor, mitigate, and respond" concept.

The assumptions of this alternative concept include the argument that biological agents take longer to affect personnel than chemical agents, that biological detectors are too slow and too few (due to their expense) to rely upon, and that initial symptoms of an unannounced attack will be indistinguishable from the background of naturally occurring diseases until too late. The key to countering unannounced BW attacks against military targets was, in this concept, meteorological monitoring, medical surveillance, and proactive countermeasures. The new tactics, techniques, and procedures would rely on *monitoring* the weather and threat conditions for increased opportunities of terrorist attacks, in addition to medical monitoring of the population. The population at risk would *mitigate* the possibility of exposure during this period of increased threat through the use of "half masks" until the threat period was over (much like is done to protect against severe acute respiratory syndrome [SARS] in many parts of the world), while exposed personnel would promptly receive postexposure medical countermeasures. The *response* portion would be a collaborative, interagency (federal and state) and/or host nation response force supporting base recovery operations and initiating investigations to identify the attack perpetrator.

When this concept was proposed to the Joint Staff and the military services, the cautious response was "Why are we replacing 'avoid, detect, protect' with a new slogan that essentially means the same thing? We already do all these tasks in this proposal, except for using the half masks." The Joint Staff and the military services did not see the need to adopt a new and distinct CONOPS for BW defense, and they especially did not see the need to rewrite Joint Publication (JP) 3-11, *Joint Doctrine for Operations in Nuclear, Biological, and Chemical (NBC) Environments*, which was the intended implementation vehicle for the new concept. What these critics had not understood was that their perspective was focused on a unique scenario of a BW terrorist attack against a domestic (within the continental United States [CONUS]) military installation with an unprotected, mostly civilian population. Instead, it argued that both scenarios (military warfighters facing an adversarial nation equipped with weaponized BW agents and domestic military installations facing a smaller-scale terrorist BW threat) required the same approach, one that was distinct from how forces currently deal with chemical or radiological contamination hazards. While certainly these critics had a point that military installations were vulnerable, that did not equate to a threat similar to that which a joint force undergoing military combat operations would face. Fundamentally, the critics had ignored the point that the threats from chemical and biological agents were so similar that it made sense to use similar doctrine, subject matter experts, and equipment to meet the wartime threat rather

than developing a separate, but parallel, set of doctrine, experts, and equipment.

The Institute of Defense Analyses (IDA) facilitated the development of the draft BW defense CONOPS, which is still undergoing staffing at the time of this writing. While it does not reflect the "monitor, mitigate, respond" philosophy, OSD representatives agreed with most of what it had to say, which, at the end of the effort, was not much different from past doctrine (although it did clarify specific BW defense capabilities and shortfalls). However, they were concerned that the proposed concept did not endorse the use of half masks, which was not seen as a very effective or viable option. Of interest is that the OSD leadership chose to initiate its emergency mask program prior to any service consensus or recommendations on the overall Department of Defense (DOD) policy on how to protect military and civilian personnel at critical military installations and facilities. The debates rage on.

What Is New

Another OSD initiative in the Defense Planning Guidance was the direction that DOD should field chemical and biological defense equipment to 600 military installations between fiscal years (FYs) 2004 and 2009. This point was pushed over objections that the JSIPP would not have delivered any lessons learned on the fielding of similar equipment to nine installations in time to guide this effort and, more importantly, that fielding equipment to 100 installations per year could negatively impact the fielding of critical equipment to warfighting units. Upon reflection, in the summer of 2002, the number of bases to receive equipment was reduced to 200 (over 6 years), with a plan to start with 15 in FY04 and ramp up to 50 in FY09. OSD estimated that it would take approximately one billion dollars to address the requirements of those 200 installations, using the estimates derived from very rough and unrefined calculations developed by a joint service working group in November 2001.The funding was taken from military antiterrorism efforts, traditionally focused on conventional (other than chemical or biological agent) terrorist threats. It should not be a surprise that the big-ticket item in these calculations was the employment of biological detectors and medical-diagnosis tools at each installation.

The question that remains unanswered is: How will installation commanders execute BW defense, given that, while the population is vulnerable, the risk of terrorists using biological agents is not as likely as their using conventional weapons? Given that there are little to no resources to operate and sustain this equipment, how are installation commanders to maintain a viable chemical and biological defense throughout the year? This question was presented to the CJCS to answer by June of this year. The other looming question that remains unanswered is: What is the DOD policy for physically protecting personnel, other than U.S. forces (government civilians, contractors, military dependents), against chemical and biological hazards? This question has remained unanswered since asked by the Vice Chief of Staff of the Army, General John Keane, in November 2001. On 5 September 2002, the Deputy Secretary of Defense released a memorandum stating that all personnel working or living on a military installation, CONUS or outside the continental United States (OCONUS), would receive appropriate protection. Exactly what the term "appropriate protection" means in terms of implementation concepts and equipment is still being developed.

Operation Iraqi Freedom caused the military services to look hard at their BW defense operations and, in some cases, come up with new CONOPS. The Air Force has a BW defense working group examining the development of a CONOPS unique to air base protection. Each branch of the military service has developed tactical concepts for employing dry filter units (air samplers) for force protection, in addition to supporting military operations. The Navy, in particular, developed biological sampling protocols to ensure that their fleet and shore-based forces could collect, sample, and diagnose potential BW hazards as quickly as possible. And the Army Biological Integrated Detection System (BIDS) platoons, as well as the U.S. Army Technical Escort Unit and a theater Army medical laboratory, deployed to the Middle East to support operations.

Recent operations have provided a great deal of data to the Joint Requirements Office for Chemical, Biological, Radiological, and Nuclear (CBRN) Defense, which has the task to develop the DOD BW CONOPS, the installation protection CONOPS, and an overarching CBRN defense architecture. The basis for all three of these ideas is the "sense, shape, shield, and sustain" joint philosophy first identified by the U.S. Army Chemical School in 1999 and disseminated as "Chemical Vision 2010." While not differing greatly from the "avoid, protect, and decontaminate" philosophy, it does allow for a more simultaneous and continuous execution of the principles of CBRN defense based on the need

for information superiority than what some have identified as a chem-centric linear and detection-based philosophy.

Implications for the Future

This author will not attempt to forecast how these CONOPS will mature over the next year. The debate on how the military services perform BW defense will go on, if not intensify, due to the lack of any recent biological incidents (since the October 2001 letters). It is my belief that the overwhelming majority of military specialists within the DOD chemical and biological defense program instinctively recognize that the effects of biological agents are distinct and different from chemical agents, just as much as they recognize that the employment of biological agents and the defense against them are very similar in principle to the employment of and defense against chemical agents. It is a question of detail and the exact tactics, techniques, and procedures that make the difference. Despite the very real concern over the possibility of biological agent use, no one has suggested that the employment of BW detectors is not a positive first step for warning or that the military should rely solely on half masks for protection in lieu of detectors.

Still, OSD has made a point about how the nonspecialists might view BW operations. Getting military leaders, other than chemical and biological specialists, to recognize the threat of chemical agents was tough enough in the 1980s and 1990s; now a similar reeducation has had to take place to recognize how we should deal with biological agent threats, given the limitations of detectors, the shortage of vaccines, and the wide variety of incubation periods and effects of various biological agents. Consider that chemical and biological specialists have concurrence that future military forces should develop a Joint Biological Tactical Detection System (JBTDS), which could number as many as 30,000 to 40,000 units (similar to the current density of chemical agent alarms). The question no one wants to answer is where are all of the collected samples going to go for testing. Certainly the Army, Air Force, and Navy, together with their forward medical laboratories, have trouble dealing with the current load of samples, let alone increasing that load. What is clear is that the critical concerns of a detector-centric BW defense approach are valid and could be a step in the wrong direction—not because detection of the hazard is not feasible, but because there are not enough laboratory facilities to process all these samples in a timely fashion. No one has adequately addressed this future challenge.

The medical community has a unique set of requirements for BW agent defense in terms of processes and what one does with the information gathered—a discussion that often becomes clouded with operational concerns. The need for a common approach to operations and medical diagnoses that are both reasonable to maintain and enable force health protection is an issue with homeland security (HLS) as much as it is with warfighting and installation protection. It may be that a simplified table (as shown in the table below) can outline how the military, as well as agencies involved with HLS, address future BW defense concepts. This table is valuable in explaining why there is such a cacophony when talks about BW defense occur. In a very real sense, there are three different customers for BW defense information, which has resulted in the need for three different levels of confirming if biological agents have been employed. Commanders need to know when they are attacked and with what so they can make immediate operational decisions—decisions other than required medical measures. They do not need a sampler in tactical detectors, a requirement that could be costly and an operational impairment. It is the medical specialists that need samples from the immediate hazard area—samples that can be verified by Food and Drug Administration-approved methods,

Biological Warfare Defense Information Requirements

Biological Warfare Terminology	Who	What	Where	When	How
Presumptive	Commanders	Information to act	Tactical	Within minutes to hours	Reasonable confidence
Confirmatory	Medical specialists	Information to treat	Operational	Within 1-3 days	Federal Drug Administration standards
Definitive	President and Secretary of Defense	Information to retaliate	Strategic	Within 1-3 weeks	International standards

allowing for medical treatment. Chain-of-custody sampling in laboratories in the United States and the United Kingdom is required so the President and the Secretary of Defense can be informed when there is no doubt as to the nature of a biological attack. This allows them to make decisions regarding retaliation. Discussing BW defense concepts can be very confusing for this very reason. While all these different discussions are going on, it is up to the military subject matter experts to initiate specific BW defense measures based on information from all three data collections. When the community can agree on a common approach and shed the confusing discussion of the laboratory labeling of "silver standards," "gold standards," and even "platinum standards" with operational information that commanders require, then real communication can take place.

The mistake we need to avoid is assuming that one detector system must address all information requirements. The primary reason we have the Joint Biological Point Detection System (JBPDS) fielded at the operational level is because science and technology could not make it small enough or inexpensive enough for tactical employment. Because it is at the operational level, its sampling capability provides confirmatory data to initiate medical decisions, not a commander's decision cycle. The initial JBPDS warning that it is taking a potential BW sample should be enough information for a commander to take action. One should not assume that future tactical detectors should merely be smaller JBPDS sensors supporting both command decisions and medical diagnosis. Otherwise, we will end up with a large number of expensive sensors flooding the theater medical labs with thousands of samples that technicians will not be able to address quickly. More likely, we need tactical detectors that do not take samples but merely provide early warning that a potential BW agent is present, much like our current chemical detectors do.

Summary

Many defense agencies and think tanks are discussing BW defense concepts, more so because of the greater perception of BW threats to military and civilian targets within CONUS rather than any recognition that the actual BW threat has changed. The military should review its CONOPS because the future battlefields are changing and new missions are emerging. The National Security Strategy and the Joint Strategic Capability Plan discuss a new construct for future operational planning, the "1-4-2-1" construct—one homeland defense effort, four complex and/or lesser contingency operations, two "swiftly defeat the efforts" major combat operations, and one "win decisively" major combat operation. Add the recent concerns that CBRN defense standards need to be better integrated into force protection and installation preparedness, and one sees a very fluid and complex environment that is different from the relatively simple warfighting environment once planned during the Cold War.

DOD needs an overarching philosophy which recognizes that CBRN hazards are diverse and different but which also uses a common doctrinal construct—one that uses a trained and ready military organization with the appropriate tools and tactics to address unconventional threats. The very unique mission areas of passive defense, consequence management, force protection, and HLS require a common set of terms and leveraged technologies to address different mission requirements and to protect different populations. It would be nice to have just one set of capabilities and one set of equipment to address all of these threats under all mission areas, but this is not a realistic near-term (or even midterm) objective. We need to recognize the significantly different requirements in installation protection as opposed to warfighting, while recognizing the unique characteristics of chemical and biological hazards. We need to use a common approach and specialized equipment developed on similar technologies, but perhaps to different parameters and timelines.

Last, the military CBRN defense community needs to proactively lead this discussion. Many "experts" are fully engaged and will continue to shape this concept, with or without the involvement of military experts. If nothing else, this explosion in HLS concerns has created many ideas and energy—not all in the right direction. The military needs to maintain its equities while participating in the intellectual discussions taking place. To not participate means that these decisions are being made for the joint force instead of with it. We cannot afford the possible consequences of these decisions.